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PRACTICAL HINTS

ON THE

CURE OF SQUINTING

BY OPERATION.

BY F. W. GRANT CALDER,

LICENTIATE OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND
ASSISTANT SURGEON TO THE SECOND REGIMENT OF LIFE GUARDS.

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THE FOLLOWING PAGES ARE DEDICATED

TO

SIR JAMES M^{c}GRIGOR, BART., M.D., F.R.S.

DIRECTOR GENERAL OF THE MEDICAL DEPARTMENT
OF THE ARMY,

&c. &c. &c.

IN TESTIMONY OF ESTEEM FOR HIS EMINENT TALENTS,

PRIVATE GOODNESS, AND PUBLIC WORTH:

AND

AS A SMALL TOKEN OF GRATITUDE

FOR THE GREAT KINDNESS HE HAS EVER SHEWN
THE AUTHOR.

INTRODUCTION.

It was not the intention of the writer of the accompanying essay to write a book, when he began to note down his observations, and to commit to paper an account of his practice on the cure of squinting by operation. An article in one of the periodicals was the most that was designed. But finding that the great majority of the cases he operated on, turned out to be such perfect cures, and that the operation was destined to bestow the greatest benefits on those afflicted with obliquity of vision; he was induced to extend his observations, and to draw out a full account of the best mode of performing it; because, he felt anxious to present his military friends—the greater part of whom, from serving in the colonies, being unable to see all that has been published on the subject—with some clear and practical hints on the easiest and safest methods of proceeding. How far he has succeeded, it will be for them to judge; but as he addresses himself entirely to his juniors, he is quite sure that, as young men—and particularly soldiers—are proverbially open hearted and generous, they possess too much kindness not to deal lightly with its faults.

When the news of Dr. Dieffenbach's successful operation at Berlin in the early part of the present year, reached this country, the author was then stationed with his regiment at Windsor. It was his fortune to have the means of immediately putting in practice the new operation on the daughter of a soldier in the regiment, whose squint, by all who knew her, was described as being hideous. The result was entirely successful, and her eyes are now so straight that none could suppose that she had ever had any thing the matter with them. The news soon spread, and by the kind assistance of Drs. White and Downes of the Rifle Brigade, Mr. Fowler, and my colleague Mr. Bett, more cases were soon operated on, and with a degree of success which offered the brightest encouragement. To these gentlemen the author takes this opportunity of publicly acknowledging how much he gained by their able advice, and how grateful he feels for the kind assistance they so readily afforded him.

The author has freely availed himself of the observations and remarks of others, in so far as he was able to judge of their value, and of their being likely to render his work more useful: but as he was confined to space, he regrets, that from this cause he has been unable to present his readers with all that he otherwise would have done. He trusts, however, that he has overlooked nothing which is really valuable, and that he has not come forward altogether unprepared.

Cavalry Barracks, Regent's Park,
7th December, 1840.

ON THE

CURE OF SQUINTING

BY OPERATION.

CHAPTER I.

As the following pages are supposed to contain a full and particular account of the readiest, and most simple method of operating for strabismus or squint; I have thought that I could not better preface the undertaking than, by recalling to my readers those few particulars regarding the anatomy of the eyeball and its appendages, which chiefly interest us in the performance of this operation.

The muscles of the orbit are seven in number, viz: the levator palpebræ superioris, the obliquus superior and inferior, and the four recti. With the first enumerated we have comparatively little to do in the performance of this operation; I shall therefore confine myself to a concise account of the others.

The obliquus superior arises along with the recti muscles from the margin of the optic foramen. It then passes forwards along the inner and upper part of the orbit, and ending in a round tendon, which passes through the ring of the cartilaginous pulley at the inner angle of the os frontis, it turns downwards, outwards, and backwards at nearly a right angle, and slipping under the body of the rectus superior, becomes thin and broad; and is inserted, midway between the superior and external recti muscles, into the sclerotic coat:—the place of insertion being nearly half way between the insertion of the recti, and the entrance of the optic nerve.

The obliquus inferior arises from the orbital edge of the superior maxillary bone near its junction with the os unguis. It has a strong fleshy belly, and ascends obliquely outwards and backwards between the inferior rectus, and the floor of the orbit; and ending in a tendinous expansion it becomes inserted into the sclerotic coat, exactly opposite to the insertion of the superior oblique, between the external and inferior rectus, and rather behind the transverse axis of the eye.

The four recti muscles arise by short tendons from the pereosteum, covering the edge of the optic foramen. Gradually becoming fleshy, they all pass forwards around the optic nerve, and a little beyond the middle of the eye they each terminate in a broad and flat tendon, which unites with its fellow, becomes attached to the sclerotic, and covers the whole of the anterior part of the ball of the eye for the space of a quarter of an inch behind the cornea;—thus forming what in common language is called the white of the eye, but by anatomists the tunica albuginea. The superior rectus is called *attollens oculi.* The inferior *depressor oculi.* The internal *adducens* or *adductor oculi.* The external *abductor oculi.* These muscles fix the eyeball, and retract it within the orbit, when they act conjointly; but individually, they move it as their names imply.

Anatomists have been hitherto divided regarding the true action of the oblique muscles. But they have been pretty unanimous in describing their principal use to be that of drawing the eye forwards so as to oppose the retracting power of the recti. Individually and conjointly they likewise roll the eyes, hence they have been called musculi circumagentes, or amatorii: and I think there can be no doubt but that to their influence chiefly, must be attributed the power of turning the eye in, which persons possess who have had their internal recti muscles divided for the cure of strabismus. Besides, we have long since had the authority of Sir Charles Bell that their combined action draws the eyeball towards the nose.

As neither the pathology of squinting, nor the physiology of the muscles of the eyeball, are so much the objects of this work, as a clear and accurate account of the manner of performing the operation, we shall at once proceed to the practical part of our task, merely remarking that, in some cases of strabismus, the internal rectus has appeared to me to have been furnished with a fibrous sheath, which extended on each side of its tendon in the direction of the other recti muscles; and which required to be divided before the eye was able to right itself. It did not appear to me that it was the tendon which was unusually broad in these cases;—yet, it might be so: morbid anatomy can alone satisfy us on this point.

CHAPTER II.

The eye, which is not to be operated on, is to be blindfolded. This I believe is best accomplished by directing the patient to close the eyelids; a small pad of lint is then to be placed over them, and secured in this position by a few turns of a roller brought around the occiput, across the forehead, and over the eye. This plan answers very well, but I should suppose that a compress of either linen or cotton, together with a small handkerchief, would suit equally well. Indeed as the latter can always be had at the patient's residence, it is probably what will be found the most convenient in private practice. Our apparatus should always be as simple as possible, and we should never appear at the patient's residence loaded for the occasion. Our instruments should be so stowed away, that neither the patient nor any of the relatives can perceive any thing different from an ordinary visit. This gratifies the patient, and pleases the friends; and it goes a great way to remove from the minds of the public the idea—but too often prevalent—that we delight in operations.

The sound eye—or rather the eye not to be operated on, for both are generally sound enough to all appearance—being thus secured, the patient is to be seated on a chair of a convenient height, and placed opposite to a window affording a good light. The head is to be made to recline slightly, either against the chest of an assistant, or what is better, upon a small pillow placed along the top of the chair. A low backed chair, therefore, is what I fancy will be found most generally to suit. Matters being thus far arranged, the patient is then made to sit upon the chair with his face so inclined to either side —depending of course on which eye is to be operated on—as to permit of the light falling chiefly upon the inner angle of the eye. This position once obtained, the assistant to whom the hook which fixes the eye is to be intrusted, standing behind the patient, places one hand across the forehead, and gently secures it in this position against his chest.

Suppose the left eye is the one to be operated on; the patient's face is to be inclined so far to the right as to enable the light to fall chiefly upon the inner canthus; the surgeon then takes up one of the small curved hooks for fixing the eye with in his left hand, and placing himself before the patient, he directs him or her, as the case may be, to turn the eye as much out as he can: this being done, he slightly everts the lower eyelid with the two forefingers of the right hand, while at the same time he insinuates them into the orbit so as to press pretty firmly upon the globe of the eye. At the same time that the operator is doing this, the assistant placed behind the head of the patient is exactly performing the same manœuvre with the upper eyelid. The ball of the eye is thus readily enough fixed, and the moment this is observed to be the case, the hook is to be introduced, with its point directed downwards, through the conjunctiva and close to the inner edge of the cornea. This point of introduction ought to be exactly on the same parallel with a line drawn transversely through the middle of the pupil. The great advantage of attending to this is, that the muscle courses along the inner side of the ball of the eye in the same line with the hook when thus fixed. The point of the hook once introduced through the conjunctiva, the surgeon is not to be satisfied with taking up a mere fold of it, he is to carry it deeper so as if possible to take up a small portion of the tunica albuginea:—a few lines breadth of either one or of both will be found quite sufficient. This being obtained, the point of the hook is to be made to emerge, but nothing more; there is no necessity for bringing it so completely out, as to throw the fold of these membranes into its curve, for by so doing there is danger of liberating the hook altogether, the portion taken up being so small that it will not permit of that degree of stretching consequent on making the posterior and thicker part of the hook go through it. It is desirable in all cases to get a small portion of the albuginea within the point of the hook, for I have sometimes found, when I had merely taken up a fold of conjunctiva, that either through the assistant dragging too much upon the eye, or in consequence of the recti muscles acting too strongly, and pulling the eye forcibly backwards, that just as I was about to commence the operation, or before I had proceeded far enough to enable me to secure the eye by placing the blunt hook under the muscle, that the conjunctiva had given way, and that before the operation could be further proceeded with, the eye required to be again secured. If the patient be not a very irritable subject, but submits quietly to the operation, the taking up of a mere fold of the conjuctiva will be found to answer every purpose; and in all cases where this can be done without in any wise disturbing the proper tunics of the eye, the easier it is for the surgeon, and the safer and less painful it is for the patient.

In my earlier operations I used to introduce the hook about midway between the cornea and plica similunaris, but I soon found that to this method there were various objections. In the first place, by the fold thus secured the eye remained really unfixed, for the conjunctiva is so loosely connected to the ball of the eye at this part, in the great majority of cases, that the cellular tissue, which connects it to the albuginea, readily tears and stretches on every contraction of the internal rectus, the moment the preliminary incision has been made through it. The consequence of this is, that the eye is really not everted, and that the muscle is of course deeper, and further from the operator, than when the ball of the eye is secured and properly turned outwards. A great difficulty is here created, and unless the operator be an experienced hand, I can readily enough believe that he might find his way through the coats of the eye, while vainly looking for the tendon of the muscle so much anterior to the position in which we naturally see it, when the eye is otherwise secured, and properly everted. In some cases too—particularly in young and full-blooded subjects—the vessels, which run beneath the conjunctiva, are here very large and liable to be punctured: hence, troublesome chemosis is apt to follow. This last mishap occurred to me once, and rendered the operation not only very tedious, but both difficult and dangerous. The circumstances were these. A young lady, full of blood and full of courage, sat down to be operated upon. In attempting to take up a fold of the conjunctiva in this situation, a vessel was pricked; the instant this occurred, it poured its blood so freely into the submucous cellular tissue, that the whole of the conjunctiva covering the ball of the eye was almost immediately elevated into one bloody mass, in the hollow centre of which was situated the cornea. An attempt was now made to lessen this swelling by freely puncturing it, but no such result followed. After a little conversation with my medical friends who were present, it was resolved that the operation should be proceeded with. Any attempt to take up a fold of the albuginea under these circumstances would have been almost impossible, without endangering the other tunics of the eye; a tenaculum was therefore thrust into the chemosed swelling, and a pretty large fold of it secured. The operation was then proceeded with in the usual way; but the moment that the conjunctiva was divided, from the attempt of the assistant to keep the eye everted by the tenaculum, and from the involuntary action of the recti muscles, both retracting the eye and turning it inwards, the whole of the inner and anterior part of the globe got stripped of its mucous lining, and the eye, instead of being everted, was actually turned inwards. When this circumstance is coupled with the fact, that there was a great flow of blood from the divided vessels, which required constant sponging up; and when we take into consideration the narrow confined space in which we have to work, my readers, who have either performed or assisted at this operation, will readily see how likely such an untoward event was to baffle and frustrate the best directed efforts at finding the muscle. By dissecting very carefully by the side of the globe, the muscle was at length found, but at a very great distance from the surface; it was then divided, and the case was successful. A circumstance of the like nature need, however, never occur, by taking up a fold of conjunctiva close to the cornea, for here it is firmly incorporated with the tunica albuginea by means of condensed cellular tissue, which will not readily permit of such an occurrence, even supposing that a vessel should be wounded. The blood vessels of the conjunctiva are, moreover, at this point very small, and not likely to give rise to any such state, even should they be wounded, and the cellular tissue of that nature to permit of chemosis taking place.

Another evil takes place, when a fold of the conjunctiva at a distance from the cornea is taken up. The attempts to keep the eye everted by it, are accompanied by a dragging upon the plica similunaris, which throws this process into transverse folds, and tends in some degree to displace it,—a circumstance, which I am quite satisfied, it is of the greatest necessity to avoid;

because I shall by and by point out that this is the best guide to the muscle, and should therefore be allowed to remain exactly in *situ*.

I used at one time to insert the hook, and seize hold of the conjunctiva with its point directed upwards, but my friend Mr. Fowler, of Windsor, observed, that it would be better to insert the hook with its point directed downwards, inasmuch as the moment the eye was touched, or about to be touched, the patient invariably turned the eye upwards. The object to be obtained was thus rendered doubly difficult, for this upward movement of the eye was, in fact, assisted by the hook, when thus introduced, instead of being counteracted by it; and it not unfrequently happened that the eye was so far carried upwards within the upper lid, by the conjoined efforts of the patient, and the assistance thus afforded by these attempts to introduce the hook, that it was found impossible sometimes to arrive at the object sought after without considerable loss of time. Since I have done the reverse, and inserted it with its point turned downwards, I have found no difficulty in at once securing the eye. Besides, the slightest catch with its point so directed, answers the purpose admirably, and enables us to proceed with the operation without any fear of its becoming loose, provided that the assistant, into whose hands it is intrusted, is but ordinarily careful. Because, as all the struggles of the eye to free itself are made in an upward direction, it is quite clear, that the greater these attempts are, the more firmly does the hook become fixed in the tunica albuginea.

This fixing of the eye, to the experienced operator, is of the greatest moment, but to the beginner, it appears to me, to be absolutely indispensable; without it he runs every chance of being foiled, in his attempts to complete the operation with honor to himself, and satisfaction to the patient. The eye being properly fixed, and quite in his command, the operation is rendered one of comparative ease and simplicity, and may be undertaken with every certainty of success, *i. e.* as far as dividing either one or other of the different muscles of the eye is concerned. I am aware that Mr. French, in a late number of the *Lancet*, has stated, that he had operated three times without fixing the eye with any hook, and that he considers its use unnecessary; and I likewise remember that in a conversation which I had with Mr. Lane, that gentleman gave it as his opinion, that the eye might be kept sufficiently everted by merely resting the blunt end of the common silver probe against the inner edge of the cornea. Nevertheless, I cannot help stating, that although, in the hands of very adroit operators, every, or any plan, may succeed, yet, as I write for the benefit of my juniors, I cannot conscientiously think of advising them to try to operate without it.

Suppose, therefore, that the left eye is the one to be operated on, I have already said that the surgeon should take the hook with which he is to secure the eye in his left hand. By so doing, he is enabled to bring it across the nose from the right side of the face, and to insert it at once into the conjunctiva without the patient being aware that such a proceeding is going on. The advantage of this method is that the patient does not see the hook approach the eye; for I have invariably found that when he does so, the eye becomes violently retracted within the orbit, and the utmost difficulty created by the conjunctiva being thrown into numerous loose folds, and becoming immediately so turgid with blood that any attempt to take up a fold of the albuginea would be very likely to be accompanied by puncture of the globe. If the surgeon is not expert enough with his left hand to enable him to perform this manœuvre with ease, he can manage equally well by taking the hook in his right hand, and placing himself behind the patient's head, with the forefingers of the left hand he elevates the upper lid and fixes the eyeball, while with the right hand he introduces the hook from above downwards, attending to the directions already given. The instrument once introduced, its handle is to be inclined outwards and confided to an assistant, who is not to pull the eye outwards, but is to rest his hand gently against the outer side of the orbit, merely retaining it in that state of eversion into which the surgeon places it.

If the right eye is the one to be operated upon, the surgeon places himself in front of the patient, and with the hook in his right hand he very easily secures the eye—by bringing it from the left—without his—the patient—being aware of the approach of the instrument; and of course, therefore, without any of those inconveniences taking place, which, I have already pointed out, as being likely to occur, when a different method is adopted.

The hook being fixed, the eye is to be somewhat everted, before the instrument is given into the hands of the assistant: this degree of eversion is well described by Mr. Guthrie, who observes, that the eyeball is to be gently inclined outwards "until the semilunar fold of the conjunctival membrane begins to yield to the traction." The eye ought, therefore, to be well everted, but nothing more;—that is, the outer edge of the cornea ought to be made to approximate the external canthus, but no further: for the more forcibly the eye is turned outwards, the more closely is the muscle behind its point of insertion, and at the spot where it is to be divided, made to lie in contact with the ball of the eye. It does not therefore strike me that forcible eversion is what is wanted, for in a great number of cases, after the preliminary incision through the conjunctiva has been made, and the dissection carried a little deeper, the muscle cannot be distinctly seen, owing to a free hæmorrhage which sometimes succeeds. It is true that the blood can be readily enough cleared away with a small bit of sponge, and that it soon ceases to flow, but in the act of clearing it away, a certain degree of pressure is necessary to get it up from the bottom of the wound,—which pressure produces an evil, inasmuch as the loose cellular tissue becomes the more impacted with the effused blood, and assumes such a uniform red and fleshy appearance, that we are utterly prevented from being able to detect the muscle by the sight. This is an event which often happens. It is, therefore, under circumstances such as these, that a proper knowledge of the true site of the muscle directs us to insinuate the blunt end of the probe under it, and by raising it from the sclerotic, enables us to divide it;—a circumstance, which I hold, cannot be so readily done, provided the eye be very forcibly everted.

The eye once secured, and the hook by which it is fixed, confided to an assistant—as already described, the operation is immediately to be proceeded with. We shall suppose that we are about to operate on the left eye. In doing so we stand in front of the patient, but at the same time so far on his left that the light falling on the eye is in no wise impeded. We now introduce the elevator under the upper eyelid, and having raised it sufficiently, we likewise give it in charge to the assistant, who standing behind the patient's head, with his other hand keeps the eye everted by means of the hook already confided to his care. Or, we may manage by intrusting the elevator to the care of a second assistant, who in that case stands on the right of the patient, and while with one hand he keeps the upper eyelid out of the way by means of the elevator, he places the forefinger of the disengaged hand on the under lid, and depresses it as much as he can, at the same time keeping it in that position. This is probably the better plan, as it enables the assistant, who has the keeping of the eye fixed and everted, to devote his undivided attention to his part,—a matter of the greatest importance to the unpractised operator.

I have often placed the spring artery forceps on the under lid, and have kept it by this means depressed, agreeably to the plan said to be followed by Mr. Liston. The lower eyelid is to be everted, and a small fold of the conjunctiva, a little exterior to the course of the punctum is to be taken up betwixt its points; the instrument is then to be closed by means of its spring, and allowed to hang down. It is an excellent plan for keeping the under lid out of the way, and in the absence of a second assistant its use I should suppose to be absolutely indispensable.

The surgeon now seizes hold of the plica similunaris at its middle with the common dissecting forceps, and with a pair of straight and sharp pointed scissors he divides the conjunctiva along its outer or corneal border. The opening thus made he prolongs by the scissors in the direction of this fold towards the upper lid, for a quarter of an inch or thereabout. Still keeping hold of the plica by the forceps, he reverses the scissors, and divides the conjunctiva in the same manner, and to the same extent in the direction towards the lower lid. An opening in the conjunctiva of about half an inch in length, and having quite the direction of the plica similunaris being thus made, the latter fold is drawn towards the nose by the forceps, while the loose cellular tissue covering the inner surface of the ball of the eye is scripped across, one portion after another, by the scissors, until a wound of at least a quarter of an inch in depth along the inner surface of the globe is made. Or, the scissors may be entered at the lower part of the plica similunaris —just where it approaches the under lid—and then carried upwards along its outer border: by this means we avoid the necessity of reversing their points, and complete the opening at once.

In dividing the cellular tissue by the side of the eye, care must be taken, on the one hand, not to wander too far in an inward direction, for by so doing we would get into the midst of the fatty tissue which fills up the space between the globe of the eye and the bones of the orbit, and thereby lose sight of the course of the muscle; while, on the other hand, we must attend not to have the points of the scissors turned too much towards the ball in case of any sudden movement on the part of the patient. The scissors should be held, so that the flat surface of their blades are opposed to the ball of the eye; and attention must be paid to the convex form of the organ,—the cellular tissue covering which we intend to divide, so as to make a neat piece of dissection of the greater part of its inner surface. It is well to divide the cellular tissue after this manner to the depth of rather more than a quarter of an inch, because a better view of the muscle in its course to be inserted into the sclerotic is thereby obtained. But the truth is, that when the eye is everted to the degree already mentioned, and the conjunctiva and cellular tissue underneath are divided along the outer border of the plica similunaris to the depth of but a few lines, the muscle, exactly at the point where it ought to be cut across, is at once exposed, and may be hooked up, and divided, without any further trouble.

When the eye is well everted, the internal rectus muscle, at the point where it is to be divided, is in fact made to lie immediately under the plica similunaris. This fold, therefore, merely requires to be lifted up, as it were, in order to expose the muscle. In many cases, therefore, when a good hold of the eye has been secured, and when in consequence it has been well everted, this process is merely required to be raised by its cellular connections being divided by fine pointed scissors as deep as on a level with the centre of the caruncula, when a sufficiency of the muscle is found to be exposed to render its division easy.

When we look at ourselves in the glass, and direct either eye very much out, immediately along the outer edge of the plica similunaris, the fleshy belly of the muscle, just where it becomes tendinous, may be seen shining through the conjunctival covering of the eyeball. This explains how very simple the operation really is, when the eyeball has been first secured, and then turned out and kept so by an assistant.

The conjunctiva in the situation already pointed out having been freely divided, and a little of the cellular tissue under it likewise cut across, the curved hook of Mr. Lucas's invention is then to be introduced. This being done, the young surgeon is not to look for the muscle, he is to feel for it: for the cellular tissue so very soon gets infiltrated with bloody effusion that there is no detecting what is what. Having fulfilled the directions given, he may be satisfied that the muscle is exposed; what he has to do, therefore, is, to take the curved probe and introduce it at the bottom of the wound, either in the direction of the upper or under border of the muscle, it matters little which, and attempt to hook it up by making the probe pass betwixt it and the ball of the eye. This should be done with great delicacy; the point of the probe is first to be directed against the ball of the eye, and then by a gentle sweep it is made to pass under the muscle. Sometimes I have been foiled in getting the muscle hooked up at the first trial: what is to be done then, is to lay aside the probe, and to take the scissors once more up, and with it to divide more freely the cellular tissue in every direction. The wound, already made, is to be made both deeper and broader:—more of the length of the muscle is thus exposed, and a greater portion of the inner surface of the eyeball, on each side of its borders, is laid bare. Failure after this is out of the question.

I have heard of a fold of cellular tissue having been taken up, and divided instead of the muscle; but there can be little chance of this being done, provided the operator will but recollect that the muscle has very much this breadth | | , and that its tendinous and fleshy fibres may readily enough be detected by the eye, when it is once hooked up. Besides, when the curved probe is under it, the surgeon finds that it has the well defined shape of the muscle as displayed on dissection; and, moreover, he is certain that he has a hold of the eye which no mere fold of cellular tissue in that situation could give him. Another circumstance, which convinces him that he has the muscle in the bend of the probe, is the facility which he has experienced in passing it betwixt the muscle and the eyeball; for the muscle just before its insertion into the sclerotic is connected to the eyeball by fine cellular tissue of a remarkably loose nature, and which offers not the least resistance to the introduction of the instrument.

While the muscle is in the bend of the probe, the surgeon has the most complete command over the eye; there is therefore, now, no necessity for the sharp pointed hook being allowed to remain any longer in the albuginea and conjunctiva: it is therefore to be taken out, and re-inserted in the tendon of the muscle, close to the curved probe, but on its outer or corneal side. The advantages of this proceeding are, that the pressure is removed from the ball of the eye,—that we are enabled to withdraw the blunt hook in order to introduce the scissors, and that we gain a greater power over it without at the same time inflicting any injury whatever on its tunics. The surgeon does this with his right hand, at the same time that he holds the muscle in the bend of the probe with his left. It is to be introduced with its point looking towards the eyebrow, that is, in an upward direction;—the object in doing which I shall presently explain.

As every surgeon is not ambidexter, and as we are now describing the operation on the left eye, it is necessary that the hook, when once thus re-introduced, should again be confided to the assistant in order to enable him to use the scissors in the division of the muscle with his right hand. The assistant keeps the eye well out, and by the hold which he has of it, he elevates and depresses it at the command of the surgeon, so as the better to permit him completely dividing every fibre of the muscle, and cleaning the whole of the inner aspect of the eye, if necessary. If the operator be ambidexter, he then takes charge of the hook himself when thus introduced through the tendon of the muscle, and keeping the eye well out he completes the operation by means of the scissors held in the left hand.

The muscle is to be divided by scissors of a slightly curved shape, and having the under blade narrow and probe pointed, in order the better to permit of its being introduced with more safety to the sclerotic.

Its division is accompanied by a slight crackling or grating noise, and it is effected with more force than any mere band of cellular tissue would require. The moment that the muscle is divided, the posterior belly retracts, and the eye can be turned outwards with the greatest facility by means of the hook fixed in its anterior portion. The surgeon or assistant, he in fact who keeps the eye everted, immediately that the muscle is divided, is sensible of a giving way in the organ, and he directly perceives that the eye can be everted with the greatest ease, and that there is no longer any resistance from its inside. The patient is sometimes likewise aware of the same circumstance, both by the peculiar sound which he hears on the muscle being divided, and likewise by the want of resistance which he immediately experiences, when he everts the eye;—for a number of my patients have told me that when they attempted to evert the eye—previous to the operation—they found it tied down as it were by something on its inside. The muscle being divided, we are enabled to see the sclerotic coat clean and shining in the line of division, and perfectly devoid of all covering,—a circumstance which leaves no doubt as to the success of the operation. The instruments being now removed, the eye will be found to stand straight forward, and, if it shews an improper inclination either way, it will be in the direction outwards. This is what happens in the great majority of cases of inward squint, when the internal rectus muscle has been divided; but it does not always occur that the eye becomes even straight, on this being effected, as I shall by and by shew.

When the right eye is to be operated on, the same directions are to be attended to as when operating on the left, only the surgeon stands on the right of the patient, whose face he inclines to the left just sufficient to permit of the light falling chiefly on the inner canthus. The surgeons left hand, in which he holds the forceps for the purpose of seizing hold of the plica similunaris, is rested against the brow and root of the patient's nose. This enables him to proceed very easily with the scissors in the right hand. The muscle once exposed, and the hook fixed in it as already directed, the surgeon stands then a little more in front of the patient, and taking the hook in his left hand he manages the eye exactly to his liking, and completes the operation with great ease by means of the probe pointed and curved scissors in the other.

In my first operations I used a small scalpel, but I infinitely prefer the scissors, which I now use in all cases, and find that it enables me to proceed with much greater ease and rapidity. This is a decided improvement in the operation, and to Mr. Liston I believe we are indebted for the knowledge of this method of proceeding.

Various kinds of double hooks have been recommended, and are being used for the purpose of being dug into the sclerotic with the view of securing the eye preparatory to commencing the operation. Hitherto, I have been contented with using the single hook invented by Mr. Lucas. I consider it well adapted for the object intended, and cannot help therefore recommending it. In my earlier operations I used a tenaculum, and I believe I succeeded then, as well as now. Young surgeons should never quarrel with their tools, — a good workman rarely complains on this point.

The only use which I have made of the double hook was, in one or two occasions to insert it into the plica semilunaris, and to pull this fold aside, after it had been separated from the eyeball by division of the connecting cellular tissue, and when from its size it happened to interfere in preventing a good view of the muscle being obtained just before dividing it. This purpose it appears to answer very well; but there is no reason why one of the single hooks used for fixing the eyeball, should not suit equally well. The necessity for holding aside the plica semilunaris by a hook can be but seldom required, and chiefly then, when the surgeon is operating on the right eye, and has both hands engaged—one holding the hook after it is inserted into the tendon of the muscle and with which he fixes the eye, the other using the scissors with which he is to divide the muscle. On one occasion, when I found it necessary to divide the cellular tissue a little deeper than common, in order the better to arrive at the muscle, the fold being held aside by an assistant after this manner, enabled me to proceed with more safety and ease in exposing the object intended by means of the scissors and forceps.

The advantage of introducing the small hook into the tendon of the muscle with its point directed upwards, as I have previously directed, is, that when we have divided the muscle, and are anxious to see whether the result is entirely satisfactory, we have no necessity for removing it in order to acquire this information, but may direct the patient to turn his eye inwards, and may otherwise observe the organ without the presence of the hook in any wise interfering. The young operator might find a difficulty in again introducing it, provided he found it necessary; and by attention to this point during the operation he may afterwards be saved some trouble.

In some cases of inward squint, it has been said that it was found necessary to divide the inner fibres of either the superior or inferior rectus muscle, or of both, in consequence of the eye not righting itself after the internal rectus had been cut across. I have hitherto met with no cases requiring such procedure, but if we did, the method of doing so is simple enough.

Having divided the internal rectus,—in the line of its division, insert the probe point of the curved scissors, and carry it around the globe of the eye in the direction of either rectus, keeping its point close upon the sclerotic, and cutting as we go. We must be careful not to go too far round, and thereby divide too much; in this, I should suppose, would lie the chief difficulty:—in the proceeding itself I can see none.

The cornea, in a number of cases, is not only turned in, but is likewise very much turned upwards, so that sometimes more than one half of it is observed to be buried under the upper eyelid, when the individual looks us in the face. This, I suspect, is owing to a greater degree of contraction taking place in the upper fibres of the internal rectus, than in the lower, when the muscle is called into action. I do not think that any other muscle conspires to produce it: at least, the results of my practice would lead me to this opinion, seeing that in a number of cases the mere division of the internal rectus sufficed to remove the deformity. In operating on cases of this nature, however, I have always been doubly careful, that no fascia or fibre of the muscle remained undivided at the upper part of the wound.

In one case, which I shall by and by relate, I divided the superior oblique muscle to a certainty. On its being divided, both ends of its round tendon hung down loose, and were visible to all present. There could be no doubt about it;—yet nothing happened: no change in the eye took place. This has gone far, when coupled with the evidence of other surgeons on this point, to convince me that strabismus convergens does not depend upon contraction of it. Besides, in the third vol. of the Anatomy of the Human Body by John and Charles Bell, we find that the following experiment was performed on a monkey; and as it corroborates so very strongly what has just been stated, I shall take the liberty of quoting it. "I cut across the tendon of the superior oblique muscle of the right eye of a monkey. He was very little disturbed by this experiment, and turned round his eyes with his characteristic enquiring looks, as if nothing had happened to affect the eye." Sir Charles likewise divided the inferior oblique with a like result. "I divided the lower oblique muscle of the eye of a monkey. The eye was not, in any sensible manner, affected: the voluntary motions were perfect after the operation." All this is to me pretty conclusive on the impropriety of dividing either oblique muscle in the present state of our knowledge.

By an extract from the Journal des Debates in the Lancet of 11th of last July, we find that M. Jules Guerin stated before the Academy of Sciences, that in four cases he had operated for squinting, and that the results had been advantageous, but not immediately so. "In one case only did the eye become quite straight soon after the operation; in the others there was merely an amelioration," and this circumstance appeared to him, M. Jules Guerin, to be a natural consequence of the true origin of squinting. Mr. Macmurdo has, likewise, seen cases at the Ophthalmic Hospital, as well as in private practice, wherein the eye continued to turn slightly inwards for a short time after the operation, although the internal rectus had been completely divided; but in a day or two this obliquity disappeared.

There is the case of a soldier on whom I operated, and which I will give in full as we proceed, which would appear to corroborate this opinion of M. Guerin, by his eye not turning out at first on the internal rectus being divided, and subsequently doing so. But I have come to the conclusion that, either a few fibres of the internal rectus, or a small portion of its sheath, were left undivided, which, by the vigorous action of the external rectus, were afterwards made to give way, and hence the reason why the eye ultimately became straight.

The following case I give at large for more reasons than one; but chiefly at present to support what I have stated: because, from all which I have seen, I feel confident, that if the internal rectus, its sheath, and fascia be divided, the eye cannot fail to turn out. Indeed, preparatory to any operation being performed, we always find, that when the sound eye is tied up, the squinting one turns well enough out. This is sufficient proof that no paralysis of the external rectus muscle exists. What therefore is to prevent the eye turning out provided the internal rectus be divided? We have seen that the superior oblique has at all events no power in keeping it in, and we may safely conclude that the inferior oblique is similarly circumstanced. The operation was performed in the presence of Staff Surgeon Burton, Dr. Fogo of the Artillery, Dr. White of the Rifle Brigade, and Mr. Bett, Surgeon of the regiment in which I have the honor to serve:—all excellent practical men, and well qualified to judge whether the muscle was divided or not. They, as well as myself, considered that the muscle was fairly divided; yet, the result proved that something more required to be done. It is the occurrence of cases of this nature, that inclines me to think, that the operations of Messrs. Fagg, and Radcliffe Hall, are not suited for every case, and that the more common method, of freely incising the conjunctiva in the first instance, must yet be the most generally successful.

Miss D. C., aged 22, had squinted for the last twelve years. When she was seven years old, she began to be affected with obliquity of vision, but it was observed by her family that she only squinted now and then,—sometimes only once in six weeks. When she was ten years old, she had a severe attack of measles, and then her left eye became "fixed," to use her own expression. Generally, the right eye was observed to be straight, and the left one to be very much turned in towards the nose, and this might be described as her usual condition: but, when she looked at any thing on her left, or towards her left, she could direct the left eye to all appearance in a natural and proper manner to the object. When she did this, her right eye was then if any thing more turned in towards the nose, than the left one was, when the right eye looked straight forward. In fact she could not avoid squinting with one eye, and although it struck me that she could use the left one properly, yet on further conversation with her, she stated that she was never able to turn it further out than midway. Moreover, when she laughed, or had her mind in any wise particularly excited, both eyes were observed to be equally turned in, and to shake about in a manner so peculiar, as to defy any one to know at what she was looking, or, indeed, if she was looking at any thing. As to her vision,—she saw perfectly well with her right eye, but with the left, the sight was very imperfect; in fact, she could see nothing at a distance with it. To use her own expression, "she had a long-sighted eye, and a short-sighted one," so, when she wished to look at any thing very near to her, she directed the left eye forward, and beheld the object with it, and, at the same time that she did this, the right eye was forcibly turned in towards the nose. This manœuvre she had got into the practice of,—not from any particular reason that she could assign, further than that she found a degree of ease in thus resting the right eye; for she stated, that she could see objects with the right eye, when close to her, just as well as with the left, provided she chose to use it.

The operation was proceeded with in the usual way. The muscle was readily exposed, and divided with the blunt pointed scissors. The posterior portion immediately retracted, and left the sclerotic quite bare and of a pale bluish colour; yet, no effect followed, *i. e.* the eye did not become everted, neither did it look straight forwards: on the contrary, it exactly remained *in statu quo*, as the lawyers say. When she looked forward with the right eye, the left one appeared to be just as much turned in, as before any thing was done. I was quite satisfied that I had divided the internal rectus, and I did not choose to do any thing more. She was, therefore, put to bed, and ordered to keep cloths moistened with cold water constantly applied to the forehead, and eyelids of the eye operated on. On sponging away the bloody discharge in the course of an hour afterwards, there was found to be a decided change for the better in the eye which had been operated on. When she looked straight forwards with the right eye, the left was not nearly so much turned in as before the operation; and when she looked straight with the left eye, the right one only turned in a little.

Five weeks afterwards I again operated on the same eye, very little further alteration having taken place. She was sensible of being able to turn the eye much further outwards, and she was satisfied that she could do so with ease; yet, when she looked one straight in the face, the eye certainly turned in so much as to form a squint,—although not nearly to that extent which it did previous to the operation. The second operation was quite successful. With some difficulty, arising chiefly from the great flow of blood, the site of the muscle was reached. A small portion in the situation of its upper border was found undivided; this being cut across, the eye immediately became straight, and remained so.

When the internal rectus has been divided, and the eye still remains turned in, Mr. Elliot of Carlisle, recommends the internal rectus of the opposite eye,—although sound,—to be cut across, in preference to the dividing of any other muscle, or muscles in the affected eye. He speaks strongly in favour of this plan, and says that he has had several cases completely cured by following it. It is curious enough that this very operation of Mr. Elliot's was much recommended to me by Mr. Fowler of Windsor, long before Mr. Elliot's views were published. It was in the case just related, that I was urged to adopt it; but fortunately for the lady, as it turned out, it was not followed.

Mr. Lucas found in one case after dividing as he thought the tendon of the muscle, that the eye was still slightly turned inwards. He introduced the bent probe, which he uses, a second time, and found that a few filaments of the muscle remained undivided at its lower part. He severed these, and immediately the eye went straight. In one of my cases the same thing occurred to me; the eye went straight when I divided the muscle, but it struck me that it did not turn sufficiently out. Mr. Bett suggested the propriety of examining whether the muscle was entirely divided: I did so by means of the blunt hook, and found a few fibres at the upper part of the wound, in the form of condensed cellular tissue, remaining as it were on the stretch. I inserted the probe point of the scissors under them, and divided them, when the eye immediately turned itself very much out. The sclerotic could then be seen, for a few lines breadth, all along the inner surface of the globe, of a beautiful bluish white colour. Curious enough to relate, this very case has been my worst; for the eye has ever since remained decidedly turned out, and has given to his countenance rather a burlesque appearance. The eye operated on was the left, and when he looks straight forward, he sees every thing double. The result of this case has convinced my friend, and myself, that the muscle, and nothing more, should be divided;—if that will possibly do.

I cannot better conclude this account of the operation, than by quoting the following passage from Mr. Guthrie's pamphlet. His remarks are excellent, and worthy of attentive perusal. The muscle being divided, and the operation supposed to be finished, "The patient should now be desired to open the eye by raising the lid, and to turn the eye inwards; if he cannot do this the operation has been completed, but if he can do it in the slightest degree, the muscle, or its lateral cellular or tendinous attachments, has not been entirely divided, and the eye being again secured by the fore finger or the elevator, the scissors are to be used, or the director is to be once more introduced, and the undivided part sought for and incised, when it will be found that the patient can no longer turn the eye inwards, and it is surprising how small a portion of attachment can do this, either on the under or upper part. In the earlier operations performed, I was not aware of this circumstance, and in two cases in which a slight turn *inwards* re-appeared a fortnight after the operation, I attributed it to this portion of membrane, which in all probability adhered to the posterior end of the divided muscle. It may also effect this slight turn from its connection either with the rectus superior above, or the inferior below, as the case may be. In three of the last cures performed, the eyes would not turn outwards, although the sclerotic coat was rendered distinct to all present, for nearly three-eighths of an inch every way, which indeed ought always to be done to ensure success, and it was only by dividing the additional band of membrane or tendinous expansion, I have alluded to, in one case above, and in two below, that the operation was perfectly completed."

Mr. Fagg operates by making the patient evert the affected eye, and by then introducing under the lower border of the muscle a curved kind of a knife, having a point sufficiently sharp to enter the conjunctiva, but unable to pierce the sclerotic, unless undue force be used. The knife is then carried upwards, between the muscle and the sclerotic coat, and when made to appear at the upper edge of the muscle, it is brought out by at once dividing the muscle and conjunctiva covering it. It quite resembles the operation of dividing the tendo achilles, but with this difference, that in the latter operation no more of the integument is divided than is necessary to admit the knife, the tendon being divided under the skin. I am quite satisfied that an expert operator might, with ease, do the same with the internal rectus of the eye—merely dividing as much of the conjunctiva, as would be necessary to admit the point of the instrument; but I would recommend no beginner to try such a method. It is worthy of being attempted however, particularly as there are some, who are inclined to think that the staring appearance of the eye, which sometimes follows, is owing to too much of the conjunctiva, and cellular tissue underneath, having been divided in the preliminary incisions.

Mr. Radcliffe Hall of Manchester, operates in much the same manner as Mr. Fagg, by making a snip in the conjunctiva in the situation of the lower border of the muscle, capable of admitting the probe pointed blade of a curved pair of scissors, which he then directs carefully under the tendon of the muscle, and when he has brought its point to visibly project at its upper border, he then finishes the operation by closing the blades of the scissors, and thus at once dividing the muscle and parts covering it. These operations are no doubt elegant, and after a man has had a little practice in the more simple way, he may try his hand at them; but for a beginner, I should doubt much, whether they were the most advisable to commence with.

CHAPTER III.

The division of the muscle close to its insertion, is decidedly the most convenient point for the operator, independent of any other advantages which may be said to accrue. But I am satisfied that it may be divided through its fleshy belly without the slightest risk of any reunion taking place, and with equal success. I say this much because I have in several instances done so, and the result has been as I have stated. Indeed, in consequence of the manner in which the eye is kept looking straight forward by the action of the external rectus, after the internal muscle has been divided, I cannot think that there can be much risk of adhesion of the muscle taking place. It appears to me that the divided edges must be rather widely separated than otherwise. Nevertheless, Mr. Lucas has had to operate a second time in a few cases, in consequence of the eye becoming after a certain time again inverted. In none of my cases has this happened, although in one there did appear at the end of a week or ten days after the operation, a disposition towards a return of the affection. I have elsewhere pointed out the means which I took to thwart this tendency; but whether there was a *bona fide* disposition towards a return of the disease or not in this case, I cannot take upon me to say with certainty. Mr. Lucas's remarks on his cases are, however, good, and I shall therefore give them at length. He says, "In two cases I had to operate a second time, and this gave me an opportunity of ascertaining, in the living subject, what became of the muscle after its division. In them the eye, after the operation, became, as in the case of Mr. J., perfectly straight, so much so, that I possess a drawing of one of them which was taken before and after the operation, by Dr. Pettigrue. The eyes began to turn in on the eighth day after the operation, but in none to the extent that they did previously. After having made the incision of the conjunctiva in the usual manner, I clearly saw the mark of the original attachment of the muscles in both cases, and a short distance behind this point (from a line and a half to two lines) I found the muscle adherent to the sclerotica. I again slipped the blunt hook beneath each muscle and divided them, when the eyes became perfectly straight." Lancet 4th July.

Mr. Lucas likewise met with a case, where the internal rectus muscle was unusually developed. "It was fully twice as large as I expected, or as anatomy reveals it to be; it was powerfully contracted giving it a rounded appearance, and was very red and vascular." Lancet, 4th July, 1840. I met with the same state of muscle twice, but in both cases, I am now inclined to think that I was too far back;—I was two deep in fact by far, and had entirely lost sight of the tendon. On the fourteenth day after the operation, the eye, in Mr. Lucas's case, where the muscle was thus unusually developed, was found to be inclining inwards; and this was observed to be most remarkable when both eyes were directed forwards. A second operation was afterwards performed, and, it is said, with perfect success.

In one or two cases where I thought there appeared a disposition for the affection to return again, I directed the patients to perform the following manœuvre, and I think with good effect. The patient was requested to practise several times during the day turning the eye outwards. Now, as a man cannot turn one eye out, without turning the other eye in, it is necessary while the patient is practising this turning outwards of the eye operated on, that he should with one hand close the eyelids, and press pretty firmly with the fingers the ball of the sound eye, so as to fix it, and prevent it from acting in sympathy with its fellow. The object to be obtained by doing this, being to prevent the possibility of the sound eye being made to turn too much inwards,—an event just probable, seeing, that in the majority of the cases of strabismus convergens there is a strong disposition to the same affection in what is considered the sound eye.

A small sunken eye renders the operation difficult: a contrary state of the organ makes it easy.

Tumid eyelids are a decided inconvenience,—particularly when conjoined with a small eye—from the confined space which they leave us to work in.

A nervous state of the individual giving rise to repeated floods of tears, is another obstacle to a speedy operation.

A spasmodic state of the arbicularis palpebrarum muscle taking place during the performance of the operation,—an interesting case of which occurred to me while operating on a young lady about twenty years of age. She was of full habit of body, and might be described as being rather muscular for a female. She sat down to be operated on with great courage and determination, but the moment the eye was secured, the eyelids became forcibly contracted, so that even with the spring artery forceps on the under lid, and an assistant pulling at it to boot, the greatest difficulty was experienced in keeping the eyelids so far asunder as to enable us to proceed with the operation. The space in which we had to work, was of the smallest possible nature, and rather a considerable oozing of blood took place from the divided vessels—the consequence most likely of forcible injection of the vessels from the strong muscular contraction. By proceeding with care the operation was, however, finished with success. The patient appeared quite unable either to prevent, or to ameliorate the state just described.

I met with one case where no plica similunaris existed, or to all appearance ever had. In commencing the operation I took up a portion of the conjunctiva close to the caruncula; the muscle was just as easily found as in the other cases, and the result was equally successful.

Cases of strabismus divergens of every shade are met with, but they are infinitely more uncommon than cases of strabis: converg:. A well marked case of turning outwards of the right eye in a young girl, who looks straight forward with the left eye, I have engaged to operate upon. When the sound eye is closed up, she can only bring the right pupil to the axis of the orbit, and the sight is very imperfect in it. I refused to operate on a gentleman, whose case was exactly the reverse of the rifleman's given at another page, for when he looked forward with the right eye, the left turned out, and vice versa. The vision was perfectly good in both, and the deformity was not very unpleasant to look at. A lady of my acquaintance has the same affection in both eyes, but only in a very slight degree; her appearance is rather pleasing than otherwise.

In dividing the external rectus, the same general rules are to be attended to as in operating for inward squint. The eye is to be well inverted and fixed; and as we have no plica semilunaris for a guide, the conjunctiva, where it passes from the ball of the eye to the joining of the eyelids, is to be snipped across to the same extent, and in much the same manner, as in the inward operation. In short, the whole is to be conducted on like principles, only the eyelids are best held asunder by the fingers of an assistant, and as their commissure tends to overlap the wound, we are compelled to fish, as it were, for the muscle with the blunt hook.

When the operation is entirely over, a piece of linen or cotton rag wet with cold water is to be placed on the forehead, and over both eyes. This is to be kept constantly applied for the next two days, during which time the patient is to be kept in a darkened room, and the strictest antiphlogistic regimen enforced. On the third day the wound begins to suppurate, and all danger of inflammation may then be said to be at an end. These rigid measures may therefore be gradually dispensed with.

A granulation, more or less of the size of a pea, sometimes springs up in the line of the incision. It is better to be in no haste attempting to cure it, for as the wound contracts I have sometimes found it to disappear of itself. Sometimes again, the gaping and swollen aspect of the wound, for the first few days after the operation, gives the appearance of a granulation when no such thing really exists:—any interference in a case of this nature is sure to create a thickening and tedious discolouration, which it takes weeks to dispel. If a granulation does arise it ought to be allowed to remain until the wound has completely contracted, when it will be found to project from the cicatrix by a narrow pedicle, which may be divided by scissors with the greatest ease, and thus got rid of at once. It generally springs up from the centre of the wound, but on one occasion I found it arising from the upper angle, and creating an uneasy feeling at the inner corner of the eye. I could see no cause for the sensations described by the patient—a lady; but on elevating the upper eyelid I found a hard granular body of the size of a large pin head projecting from the cicatrix, and connected to it by a small stalk-like process. I divided it by scissors and it did not grow again; and with its removal vanished all uneasy feelings.

If the surgeon prefers following another course for getting rid of this granulation, I know of none better than eating it down by means of the nit: argent: or sulph: cupri, applied every day or every other day. Or, a solution of either salt may be used with equally good effect.

In my first operations I used to secure the eye by taking up a fold of the sclerotic midway between the plica similunaris and cornea, but I soon desisted from following this plan for more reasons than one. In one case most violent sclerotitis succeeded, and I had some difficulty in saving the eye uninjured. In another, most acute pain came on two hours after the operation, and continued without any intermission for rather better than two hours, during which time the lady assured me that she had suffered quite a martyrdom. It then went off, and did not again return.

CHAPTER IV.

It is altogether surprizing to observe how very perfect some of the cures really are after this operation. In the great majority of cases the eye can be so well turned towards the nasal canthus that none but a medical man could detect that this movement is not as perfect in the eye operated on, as in the other. But, as in the majority of the cases of strabismus convergens which I have seen, and have operated on, there is likewise a strong disposition to the same affection in the opposite eye; it results, that after the operation this too great inversion of the sound eye becomes very conspicuous, and gives to the eyes a certain dissimilarity in their action, when the individual looks pretty strongly to either side. If he looks well to the left—supposing the right eye to have been the subject of operation — the vacant space, between the inner edge of the cornea and the caruncula of the eye operated on, is easily enough remarked in many cases, but particularly in those where the patient enjoys the perfect use of the left eye, and can therefore turn it outwards to the natural extent.

The difference is most striking, however, in such a case when the individual looks to the right, for then the too great turning inwards of the left eye becomes very conspicuous, and renders the dissimilarity more apparent.

There is another circumstance, which in a particular manner increases this very imperfection; viz. that a good number of the eyes operated on do not become everted to the natural extent when the individual directs both eyes well, either to the right or the left, as the case may be: and as the sound eye in the majority of these cases becomes really too much inverted when the person looks so as to turn it towards the nose, it is clear that we have here another cause for this imperfection in the action of the two eyes. The person so situated, being made aware of this, can always manage so as to prevent it from being particularly observed, by avoiding to look at any thing very much sideways, and always remembering to turn himself so far round as to enable him to look at every thing in as straight forward a line as possible.

This inability to turn the eye operated on completely out, when the individual looks with both eyes, either to the right or left as the case may be, I am satisfied in no wise depends on imperfect division of the muscle, because in those cases the eye operated on is invariably straight, and when the patient looks right forward at any object, both eyes are observed by all to be remarkably well placed, and to shew the most perfect uniformity in this position. Now, this is a circumstance which is not observed to be always the case, when the eye operated on happens to turn thoroughly out, on the patient looking well either to the right or left; for then, when he looks right forward, the eye operated on shews a slight cast outwards. This is peculiar and deserves attention; and is in some way, I suspect, dependant on the mechanism of vision, for I have always found that when the sound eye was shut, the patient had the most perfect freedom in turning the one operated on outwards to the utmost extent. But immediately that both eyes were opened and he was directed to look well to the right—the right eye having been the one operated on—it was very apparent to all that the right eye did not turn so much outwards as it ought to do; that is, it did not quite approximate the external canthus, while the marked turning inwards of the left eye rendered this imperfection more apparent, in the manner which I have already explained. It is likewise worthy of remark that I have never heard one so situated complain of double vision, an evil which some have found a great inconvenience, whose eyes after the operation became a little too much turned out, when attempting to look right forward. From having observed this, I have been led to the conclusion, that the eye operated on is prevented from turning completely outwards by the sound eye exercising a sympathetic influence over it, through the medium of its internal rectus which still remains undivided. I do not, however, recommend it to be divided; on the contrary, I am of opinion that nothing should be done, for the imperfection is but slight, and any attempt on the sound eye may be attended with consequences such as, I shall by and by relate, have occurred to me in a case where the patient was not satisfied with the first operation, but would have a second performed on his other eye. I have just said, that in these cases I have not observed that double vision was ever complained of. It is clear, however, as both eyes do not observe the same axis when looking at any object placed on either side of the individual, that we must find another explanation for the circumstance of their not then seeing double. The occurrence, I fancy, is owing to the fact that the vision of the eye operated on in these cases is not so good as in the other eye; and hence, although the patient appears to be looking with both eyes, he is yet in truth only looking with one. This is, however, a mere hypothesis, and I confess that I am more inclined to attribute the cause of it to the probable circumstance of the sensible spot in the retina of both eyes not corresponding.

In some of my cases the eye operated on has appeared larger than its fellow; and in those cases I particularly noted that previous to the operation it looked the smallest. Is this owing to the eye being allowed to project more in consequence of the division of the internal rectus, and the removal, therefore, of its binding influence over the eye? and in cases of squinting, does the muscle act such a part upon the globe of the eye as not only to turn it unnaturally inwards, but likewise to retract it to such a degree within the orbit as to make it appear smaller than it really is? I think we must answer these questions in the affirmative, and although we do so, I nevertheless to a great extent agree with Mr. Mayo, who is of opinion that it arises from the action of the two oblique muscles, drawing the eye forward, from their being not now sufficiently antagonized. I look upon this peculiar staring appearance, or seeming largeness of the eye after the operation, as one of its greatest drawbacks. I am unable to say how it is to be avoided, and I cannot take upon me to say why it takes place in some cases, and not in all. I have known it to occur when the muscle was to a certainty barely divided, and I have known it not to happen after the whole of the inner aspect of the globe had been deprived of all covering by a neat and tedious dissection. In a conversation which I had with Mr. Lucas on this point, he told me that he had divided the internal rectus of the other eye,—although it was not affected with strabismus—with the happy effect of rendering both alike, and thereby removing the apparent deformity. This was certainly a bold proceeding, and reflects great credit on his ingenuity and judgment; but, hitherto I have been contented with waiting to see whether the remaining recti may not ultimately retract the eye within the orbit to such a degree as to render the affection of but trifling moment. I have some idea too that the eyelids may by and by stretch, and thus assist in lessening it: and I begin to think that some of my early cases do not even now shew that degree of staring, which they did at first.

In children, and in boys and girls under fifteen, squinting is often a temporary affection. Those cases are not suited for operation. The case must be one of "fixed squint," as the people call it, before the operation ought to be thought of. I saw a boy at Windsor with congenital cataract of one eye; he had no fixed command over it; it rolled about in all directions, and now and then became so inverted as to form a case of pure squint. In a case of this kind, the line of proceeding would be to remove the cataract, when most likely the strabismus would disappear. Temporary squinting sometimes attends cases of complete opacity of the cornea; and sometimes permanent squinting is combined with partial opacity of the same part. A milliner applied to me with the inner and under half of the cornea of the right eye completely opaque; in addition to this she squinted very strongly with it: she was 27 years of age, and had had both affections from her childhood. I divided the internal rectus with success, and with good effect, for her appearance was improved by it; and, now, should at any time she want an artificial pupil made—for she is totally blind upon it from closure of the pupil—she is in a better state to have it done. This is a kind of case in which I presume Mr. Lucas would not have operated, for he appears to have refused to perform the operation in a case somewhat similar; and as his reasons are very good I shall take the liberty of quoting them. "In one case there was adhesion of the iris to the cornea, and opacity of the latter for one-third of its circumferance. The eye in this case was evidently inverted to admit the rays of light through the transparent part of the cornea; and here an interesting question presents itself, viz. whether in cases of opacity of the cornea, calling for the operation of artificial pupil, instead of incising or detaching a portion of the iris, the object of the operation might not be attained by dividing a muscle, and thus, at the expense of a squint, to bring the transparent part of the cornea in a more favourable position for the transmission of the rays of light?"

I quite agree with Mr. Guthrie in the observations which he has made regarding the improvement in the personal appearance being the principal point gained: but it is contrary to what I have observed, to say that the sight becomes gradually improved, for whatever amendment has taken place in my cases, has invariably occurred within the first few days after the operation—sometimes indeed instantaneously; but it has for the most part been trifling, and of no great moment. Yet, I ought to speak more cautiously on this point; for some of my female patients inform me that their sight has been greatly improved by the operation.

Strabismus convergens is a much more common affection than strab: divergens. Both sexes appear to be equally liable, and both eyes seem to be equally subject to it. Among the causes enumerated, are the diseases incidental to childhood, as measles, scarlatina and hooping cough: likewise small pox, fevers, blows on the head, falls, exposure to a sudden glare of light, forcible inversion of the eyes, as in mimickry, convulsions, fits; and it is thought to be sometimes congenital. The operation has been performed, it is said, with perfect success on children of four, and on old men of sixty two. I have hitherto met with no cases in my own practice, which led me to suppose that the affection ever depended on paralysis of the external rectus; and I have not often met with cases where I had much reason to suppose that the affection depended on contraction of the internal muscle. For generally when the sound eye was closed up previous to operation, the squint entirely disappeared, and the patient was able to turn the eye outwards to the natural extent. Sometimes, however, when the sound eye is closed up, the patient is still unable to direct the pupil further out than the axis of the orbit. I am satisfied that the squint in these cases, where, previous to the operation the individual is able to turn the eye thoroughly out, when the sound one is closed up, is in no wise dependent on the imperfect vision which it then has; for whenever the internal rectus has been properly divided, it became straight and regularly followed the other in all its movements. Miss D. C.'s case at page 41 is a beautiful illustration of this; and the case of the milliner alluded to in page 68 proves that when the squint is removed, the organ, although totally useless, will get right itself, and act in uniformity with the other.

As wry neck depends on contraction of the sterno-mastoid muscle, so I think squinting bears an analogy. The instance of the paralytic mouth, alluded to by Mr. Guthrie, would indicate that paralysis of the external rectus might be a cause, but practice proves it otherwise; for the eye immediately becomes turned out, on the internal rectus being thoroughly divided. It is quite possible that the two oblique muscles might do this without the aid of the external rectus, but in such a case, as the person still retains the power of turning the eye inwards, we must allow them to have a double junction, viz.—that of turning the eye both in and out. (Since writing the above, I have operated on a case in which this appears to have been verified.) Those, however, who attribute the power the patient has of turning the eye inwards after this operation, to the conjoined efforts of the inner fibres of the superior and inferior rectus, may hold this opposite opinion with propriety; for as the rifleman, whose case is just to be related, could turn the eye in as well as those can do, who have merely had the internal rectus divided, it is clear that the case is much in favour of this opinion as held by many,—that it is the inner fibres of these two straight muscles which turn the eye in after the division of the internal rectus, and not the oblique muscles.

Squinting certainly has more causes than one. What we want to know is, why the operation should be sometimes successful, and not always. In those cases where the operation has been attended with so much good, is it? that they arose from unnatural shortening, or contraction of the internal rectus. In every case on which I have operated, the muscle has appeared quite healthy; yet, as mere shortening might exist without change of structure, the deformity may have depended on diminished length. Shortening of the muscle is to all appearance likewise an *effect* of the *cause* of squinting, as is evident from the case of E. G. related further on; for previous to operation, he could not turn the squinting eye further out than the axis of the orbit, and yet on its being divided, the squinting was not cured. This fact is still more puzzling, and in the meantime prevents us from arriving at any satisfactory conclusions on this point.

The influence of the one eye on the other is very great, and often interesting to observe, as the following case proves. A governess, aged 27, had squinted for seven years,—an evil which she attributed to hard reading and confinement within doors. The right eye was the one affected: its cornea when she looked straight at one, was not only turned in, but was likewise so turned up, that about one half of it was buried under the upper eyelid. The left eye was likewise somewhat unduly turned inwards, but immediately that the right eye was set straight by the division of the internal rectus, the left eye gave a few peculiar circumvolutions, or shakes, and almost instantly became straight. The following case I give at length, as it exhibits a species of squinting not often met with.

A rifleman, aged 30, had squinted since he was six or seven years old. He had this peculiarity in his squinting, that he could do it with either eye at pleasure. Generally, however, he squinted with the left eye,—a circumstance which I am inclined to think was owing to his being so much accustomed to direct his right eye forwards in firing. We are, besides, naturally more inclined to use the right one,—we instinctively lay hold of an object with the right hand, and for the same reason, I think it not improbable but that we fix the right eye most strongly on an object: at all events the right eye has generally more perfect vision than the left, a circumstance only I think to be accounted for after this manner.

In this man, however, the sight in both eyes was equally good,—an occurrence not often met with in a squinting individual:—the eye affected with obliquity of vision, having generally very imperfect sight. This peculiarity, I suspect, must be attributed to its constant use, and the perfect command which he had over it. When he looked one straight in the face, he certainly squinted very strongly inwards with the left eye, but if his attention was directed to a second individual, and that individual was standing for instance upon the right of the one immediately before him, so that he was obliged to turn his eyes but a very little to the left, the left eye (the squinting eye) readily fixed itself in a natural and proper manner upon the individual, and the right eye then presented all the characters of a well marked case of strabismus convergens. This puzzled me much, and shook my faith in the hopes of a successful operation. When this peculiarity in his case was mentioned to him, he said that he constantly observed the same thing, while he was shaving. He stated that the squinting eye was so much under his command, that when he was employed in shaving the left side of his face, "it went perfectly right, and that then he continually observed the right one to go entirely wrong;" *i. e.* it became forcibly turned inwards.

As the left eye was the one with which he generally squinted, it was selected for the operation. Dr. White, the surgeon of the regiment having the liberality and politeness to permit me to operate, I commenced and finished the operation in the usual way, only dividing the muscle much further back — more through its fleshy belly, than at its tendinous termination. No effect followed, that is, the eye did not become everted, neither did it stand straight forwards. On the contrary, it remained just as much turned in as before the operation. He was able to evert it, and he was likewise able to look straight forward with it, but he had likewise the most perfect command over it in turning it inwards: and when he looked me in the face,—both eyes being uncovered—he just squinted as much with it as ever. The eye was, therefore, again fixed and everted, and I attempted carefully to clear the whole of the inner surface of the globe of every thing like condensed cellular tissue, or tendinous aponeurosis: in doing so, while engaged at the upper part of the wound with the scissors, I accidentally snipped across the tendon of the superior oblique muscle, just where it approaches the eye to pass under the superior rectus. I now desisted, and sent the man to bed, apparently not one whit the better for all this further proceeding. For the next four days he remained squinting as strongly as ever with the left eye, but on the two following days it was observed to shew a disposition now and then to become straight. In the course of a few days more, it became entirely straight, and remained so;—the right eye at the same time becoming strongly turned inwards. I cannot describe his condition after the operation better than in the words of Dr. White, who in writing to me some time afterwards, observes, "you will be glad to hear that the case of the man of ours, upon whom you operated is not a failure. You may recollect that the left was the eye operated on. Well, this is straight now when he looks at any object, whereas the opposite eye is turned towards the inner canthus quite out of the axis of vision. The reverse of this was formerly the case, of which the man himself is quite aware; and he is now very desirous of having the operation performed upon the right eye." In this wish of the man's the Doctor cordially joined, assuring me at a subsequent meeting, that he thought that division of the internal rectus of the right eye could complete the cure. I saw the man sometime afterwards, and it struck me then, that the swelling and thickening of the conjunctiva at the inner canthus left by the healing up of the wound, prevented the eye from turning inwards;—that in consequence, it was thus kept mechanically forwards as it were:—and that as he must squint with one eye, he was therefore obliged to squint with the right.

This opinion, however, I was obliged afterwards to rescind, for the result proved my friend to be in the right. Better than two months having elapsed since the period of the operation, and the left eye remaining perfectly straight, while the right one was much turned inwards; and as all the thickening of the conjunctiva had entirely vanished, and no trace of the operation was visible, I could no longer withold my assent from a second operation being performed on the right eye. Before it was commenced, I particularly observed that he could not squint with the left eye, even when directed to look well to the right; but that it appeared natural in all its motions, while the strabismus in the right one was very strong and well marked. The operation was performed by Dr. White, and as I assisted him, I took particular notice that he merely divided the tendon of the internal rectus. The result was most satisfactory, both eyes were thus made just as straight as eyes generally are; in other words, this second operation rendered the case eminently successful. I have already alluded to this case, and given it as my opinion that some portion of the fibres of the muscle had been left undivided at the first operation.

The success which has since invariably followed a thorough division of the internal rectus and its fascia, has led me to this conclusion. What we have to dread now, is not our being able to cure an inward squint, but how we are to prevent an outward one taking place in its stead.

Mr. Lucas met with two cases of pretty much the same nature as the preceding. They were both young girls, and when they were requested to look directly at an object with either eye, the other immediately turned inwards so as nearly to conceal the cornea. He divided the inner rectus of the left eye in one, and of the right eye in the other, and he was to operate on the opposite recti afterwards.

Double vision has been held forth as one of the results of dividing the recti muscles for squinting; and truly, if it was often to occur, it would be a sad objection to its ever becoming a legitimate operation. But my opinion is, that this is an occurrence which we have not often to fear, for generally the squinting eye has very imperfect vision, and although on being let free, it does not exactly follow the axis of the sound eye, yet its defective sight prevents it from giving rise to the distressing circumstance of seeing every thing double. When the sight of both eyes is equally good, and when both are more or less affected with strabismus, the operating on one eye is either attended with double vision, as the case of E. G., which follows, will illustrate; or the other becomes permanently turned inwards, as in the case of the rifleman just related. Sometimes again, neither the one or the other of these events take place, but a circumstance of a different nature occurs, as the following case proves. A servant maid squinted with both eyes, and saw equally well with each. Generally, when she looked at one, both eyes were equally turned in towards the nose, so that she presented no very distant resemblance to an owl; but very often, one eye was well inverted and entirely out of the axis of vision, while the other might be described as being pretty straight. The internal rectus of the left eye was first divided. This enabled her to turn the eye completely out, and it remained straight; the right one at the same time became inverted. Every now and then, however, when she looked right forward, the same disposition to become inverted, and to observe the same degree of obliquity as used to exist in both eyes previous to the operation, shewed itself. The consequence was that the eye operated on became considerably inverted, and turned upwards, as if indeed little had been done for it; and the right eye, to observe the same axis with its fellow, became more everted than it used to be, but at the expense of causing her an infinite degree of pain. This pain she described as a stretching and a violent squeezing of the eye, and she hailed the operation being performed on it with pleasure. The operation was quite successful in every way,—the pain instantly vanished, and both eyes were rendered perfectly straight.

In the following case, who but sees that we have yet something to learn regarding the pathology of squinting, before we can decide with any degree of certainty on the cases which are really suited for operation; and who is there that can hold out invariable success to follow division of either one or more of the straight muscles of the eye, after a careful perusal of it.

E. G., aged 27, has squinted ever since he can remember. His left eye was very much turned inwards, when he was ordered to look straight forward; and he was unable to turn either eye further outwards than what might be described as being straight. When directed to look well to the left, the right eye turned in too much; so that, indeed, he may be described as having squinted with both eyes. As the left eye was the one with which he generally squinted, and as the vision of it was likewise somewhat imperfect—although it was much better than is generally met with in a squinting eye—it was selected for operation.

This man's case I have already alluded to, as the one in which the eye turned too much outwards on the internal rectus being divided. It was my opinion then, and it was likewise the opinion of the gentleman who assisted me, that, if we had not divided a portion of fascia which lay in the situation of the upper border of the muscle, this too great eversion would not have happened. The result of the operation on the right eye has now convinced us that, in this particular, we were wrong, as shall presently be shewn.

In a few days after the operation, the wound healed up, and the man returned to his work. By and by, he told us that if he looked with both eyes on any object placed in front of him, or on his right, he saw it double. The consequence of this was that he always kept looking to his left, because then he saw every thing in a proper manner. The left eye on this account became still further everted, and the right one more inclined inwards. When spoken to, he always stood with his face inclined to the left, in order to facilitate his placing both eyes on the person, and seeing single at the same time.

When the right eye was closed up, he was able to look straight forward with the left one, and he could turn it just as much inwards, as can generally be done by those, who have had their internal recti muscles divided. The left eye —the one operated on—projected considerably, and appeared a good deal larger than its fellow: this likewise tended to detract from the benefits of the operation.

The vision, in the eye operated on, became as good as in the other; in fact, after the operation, he saw equally well with both.

The effect of this operation on the right eye was, that he was able to turn it completely outwards,—a circumstance which he could not do before. In consequence, however, of this double vision, and on account of his observing—while looking at himself in the glass—that the right eye was somewhat unduly turned inwards, he kept continually pestering me to operate on it likewise. I kept him hanging on for some time by telling him that I thought it would go all right by and by. At length, however, he became so determined in his wishes, that I was obliged to think more seriously of his case. I then proposed to him to divide the external rectus of the eye already operated on. This he did not appear to relish much, and I could not take upon me to strenuously recommend that, over which—to say the least—there hung a degree of uncertainty as to the result. Besides, the left eye already projected too much in consequence of the loss of its internal rectus, and I did not doubt but that its appearance would be still more magnified, if it was to be deprived of its external straight muscle likewise. He was once more put off; but as I had promised him to operate again on one of his eyes, I sent for him, and told him that I was now ready to operate on his right eye as he wished, having since thought on the subject, and having come to the conclusion that doing so offered a chance of his being improved thereby. At this he expressed himself delighted, and fixed the next morning for the operation.

Before giving the account of this second operation, I shall state what was my reasoning on the subject, and what led me to accede to his wishes. I observed that, when he looked straight forward, the axis of both eyes were unequal,—the left one was somewhat unduly everted, and the right one was rather if any thing turned in—and that he was unable to bring them to bear exactly on the same object. I observed likewise, that the left eye already looked much larger than its fellow, and that when the right one was shut up, it stood straight forward, and could be both everted and inverted in a natural enough manner. I was aware that I had divided the internal rectus muscle of both eyes with marked good effect in other cases, and I began to think that I saw no particular reason, why the same success should not be the result in this man's case likewise. It will be remembered that I have already given it as my opinion, that the slight eversion of the eye operated on, arose from a little too much being divided:—in other words, that if we had not divided the fascia at the upper border of the muscle, the present turning outwards would not have taken place. This error—for error it was—likewise induced me to operate on the right eye; because, I knew that I could avoid doing the like in this second operation, and I never fancied that, if I guarded against this, there was much probability of it likewise turning outwards.

The instant the internal rectus muscle of the right eye was divided—and I took especial care that nothing more was cut—it likewise became forcibly everted. When the left eye was uncovered, it was found in the same state;—that is, it was so much turned out that a portion of its cornea was hid by the external canthus. Matters were thus very much aggravated, and his appearance was rendered much worse. By an effort he could direct either eye pretty well forward, but then the other turned very much out. And when he looked to the right with both eyes, he saw things double; and when he did the same towards the left, a like occurrence took place. The influence which the right eye had over the left, so long as its internal rectus remained undivided, is by this case well exemplified. For until this second operation on his right eye, when he was ordered to look straight forward, the left one only turned out a little: so little indeed, that had it not been for the magnified and staring appearance of the eye, few would have objected to it:—the double vision being in fact the grand fault.

This is altogether a sad case, and nothing now appears to remain for the poor fellow but to have the external rectus of both eyes divided; but whether he will submit to this or not, I cannot take upon me to say. Neither can one feel very anxious to do more for him, every thing already done, having been attended with results so different from what we have seen in like cases. From his case, however, we may learn to be very careful in operating on both eyes for inward squint, when we have found that the one first operated on, shews a disposition to become too much everted; and particularly, if vision in both eyes be equally good, for then, if both have not the same axis, each eye will receive a different impression of the object looked at, and double vision will be the result. There is a lady on whom I operated for strabismus convergens of the right eye some months since, and in whom the eye operated on, is somewhat unduly turned outwards. In her, vision is equally good in both eyes, and although she has never complained of seeing things double, yet I have observed while conversing with her, that she inclines her head a little to the left, and in this manner brings her left eye so much in, as to be exactly on the same axis with the right, when looking at one. At one time I almost proposed to her the propriety of having her left eye operated on likewise; but from what I have seen in this man's case, I would not do so now for the world.

It will be observed that the division of the internal rectus in this man's right eye, has placed him in very much the same situation in which I found him; *i. e.* in as far as it regards his squinting: and it is this circumstance which has made me remark, that we have more to learn regarding the pathology of the disease before we can undertake its cure with any good hope of success. When he looks either to the right or left, he sees double, and in so far he is a loser by what has been done; but if he looks right forward he sees things as they are, *i. e.* he has single vision. The reason of this is, that on looking right forward, one eye becomes pretty straight, and the other immediately turns out. With the eye that is straight, he sees the object in question; but with the other he sees nothing, its too great eversion having removed it from the axis of vision: and it is worthy of remark that it is the right eye which he invariably fixes upon an object in front, of him, unless previously directed to use the left. In this my readers will see a corroboration of what I have only surmised to be the fact in my introductory remarks to the rifleman's case. Before any operation was performed he looked on objects in front of him with the right eye,—the left being at the same time turned in. Now, matters are exactly reversed; when he looks at any thing before him, with his right eye, the left becomes just as much turned out, as it used to be turned in: and why? because, having lost its natural adductor, the inverting powers of the oblique muscles are unable to cope with the proper abductor which still remains entire. This I fancy is the proper explanation of the phenomenon—that the axis of vision in his eyes do not correspond, and that, in order for him to see singly, one must be removed out of the way—and not that the external recti are endowed with any peculiar, or extraordinary nervous energy giving rise to this apparently too forcible state of contraction in them: and it is this mode of reasoning which makes me hesitate to recommend any thing further being done. Cases of this nature, I am afraid, are not so very uncommon. Two of somewhat similar import are already recorded in a late number of the Lancet, by Mr. Duffin; and I have heard of others having occurred in the practice of other surgeons, but for this I cannot vouch.

Just as the above remarks were going to the press, E. G. again called upon me to say that he wanted to have something more done to his eyes. He was told that the only thing that remained likely to benefit him, was to divide the external straight muscle in either one or both eyes. This he immediately requested might be done. The operation was instantly proceeded with on the left eye; and when accomplished, it was observed, that he could turn it much further in than before; it was likewise apparent that he could not evert it to the same extent: and while the right eye remained shut, he certainly appeared to have gained by this proceeding. But, the instant the right eye was uncovered, it was found to be very much everted, while the left one at the same time looked straight forward. When, however, I directed him to fix his right eye upon me, he did so!; and the moment he did this, the left one turned out just as it used to do before this additional operation, only not quite to the same extent!. That the external rectus muscle was most thoroughly divided, my friend and colleague Mr. Bett, can bear ample testimony, as it was with his assistance that the operation was performed.

In a few days after this, the external rectus of the right eye was likewise divided, but with exactly those results which I have just described to have followed the division of its fellow in the left eye :—that is, when he looks at me with his right eye, the left one becomes everted so far as to be quite out of the axis of vision ;—and when he fixes his left eye upon me, the same thing takes place with the right eye,—it likewise becomes improperly everted. The eyes, however, do not become so much turned outwards, as they did, before the external recti were divided ; but if he attempts to fix both eyes on any object, he still sees double.

One cannot help being struck with the resemblance which this man's case, as it now stands, bears to the case of the gentleman, related at page 57, and on whom I refused to operate. The only difference is, that the gentleman has not the power of fixing both eyes on an object at the same time, and therefore he does not see double; whereas my patient can, when he chooses, so direct both eyes as to see every thing double, but, for obvious reasons, he avoids this as much as possible, and the consequence is, that one eye becomes everted, when the other is looking straight forward.

From the results of my own practice, I am inclined to think that those cases are not suited for operation, where the vision of the squinting eye is good, and approximates in perfection that of the other. For in such a case, we run great risk of substituting one evil for another. The points of vision in the two retinæ do not agree,—hence the strabismus; and by the dividing of either rectus we cannot cure this. The more thoroughly the sight is gone previous to operation, the more perfect is the cure afterwards; at least this is what I have observed.

FINIS.

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